

Indian Ants of the Indian Museum, Calcutta. No. 2.—By PROFESSOR AUGUST FOREL, Zurich. Communicated by the NATURAL HISTORY SECRETARY.

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I. Subfamily **Camponotidæ**.

Genus **CAMPONOTUS**.

1. *C. SYLVATICUS*, Oliv., subsp. *C. cognatus*, Sm., var. e. Also found in Sibsagar (Assam) and in Sind.

2. *C. MICANS*, Nyl., ♂ and ♀. Variety of colour: the body, the legs, and the antennæ are partially or totally reddish brown or pale ferruginous. Sibsagar.

3. *C. GIGAS*, Latr. (Hist. nat. Fourmis), ♀. Johore, Malay Peninsula.

4. *C. SEXGUTTATUS*, Fab. (Ent. Syst. II. 354.)

Subsp. *C. exiguoguttatus*, n. st. This subspecies resembles also *C. cingulatus*, Mayr, but *cingulatus* has long, quite erect hairs on the tibiæ and scapi.

♀. Length 5.3—8.3 millims. Narrow, like the *C. sexguttatus*, i. sp., and *C. cingulatus*. Clypeus slightly carinate, very slightly and shortly lobate anteriorly, hardly emarginate in the middle of its anterior

margin. Mandibles with 6 teeth, very delicately reticulate, with scattered puncture. Legs shining, very delicately reticulate, moderately flattened, but not prismatic; without prickles. The whole body opaque (the head anteriorly slightly shining), very finely and closely transversely wrinkled, microscopically rugged between the wrinkles; the head partly reticulate. A very scattered and large, often hair-bearing, puncture at the anterior and middle part of the head of the ♀ major. On the abdomen, the base of the hairs is rather raised. Longer and shorter, often undulating, yellowish erect hairs are scattered over the whole body; but the tibiæ and scapi are only shortly, thinly, and very obliquely pilose (pubescent). A quite applied grey-yellowish pubescence on the whole body, especially on the sides of the thorax, the coxæ, and the abdomen. This pubescence is longer and more abundant than in *C. sexguttatus*, i. sp.

Colour of the ♀ major: the abdomen yellowish, with the anterior part and a narrow transverse fascia by the posterior margin of each segment brownish. Thorax reddish yellow. Head yellowish or brownish red. The head is regularly sprinkled, especially behind, with extremely minute (nearly microscopical), round, brown spots like freckles. Legs and funiculi brownish or yellowish red; scapi and mandibles brown.

Colour of the ♀ minor: the abdomen differs only in having the three posterior segments entirely brownish. The rest of the body reddish brown, much darker than in the ♀ major. Head without freckles. Legs, antennæ, and mandibles brown.

♀. Length about 12 millims. Long, narrow, cylindrical. Scale of the petiole not emarginate. Resembles the ♀ major, but less opaque; the scutellum and abdomen are even moderately shining. Everywhere more or less delicately reticulate, hardly here and there finely wrinkled on the abdomen. Colour of the head, legs, and antennæ like that of the ♀ major; colour of the abdomen rather like that of the ♀ minor. Thorax and petiole yellowish or brownish red. Sides of the mesothorax and metathorax, two lateral fasciæ on the mesonotum and its anterior part brown. Wings tinged with brownish yellow; veins and pterostigma brownish. Sibsagar (Assam).

This subspecies is very distinct from *C. sexguttatus*, i. sp., which besides inhabits South America. But I have lately (*Études Myrmécologiques* en 1879) found the *C. extensus*, Mayr, from Australia, to be a subspecies of *sexguttatus*. In the very variable groups of *Camponotus sylvaticus*, *sexguttatus*, *herculeanus*, which are distributed over the whole world, it is better to reduce the number of "species" as much as possible, because these are not constant. According to Mayr (*Ants of Turkestan*), the *C. variegatus*, Smith (from Asia), is a variety of *C. sylvaticus*.

ticus, which I have also described (l. c.). It is possible, however, that the true *C. variegatus*, Smith (Cat. Brit. Mus. p. 18), is more closely allied to *C. sexguttatus*, subsp. *exiguoguttatus*.

Genus POLYRHACHIS.

5. *P. BIHAMATA*, Drury (Ill. Nat. Hist. t. 2, pl. 38, 1770), ♀. Tavoy.

6. *P. ARMATA*, Le Guillou (Ann. Soc. ent. Fr. T. X. 1841) (= *Polyrh. defensus*, Smith, Cat. Brit. Mus. p. 62; = *Polyrh. pandarus*, Sm., l. c. p. 65), ♀ and ♀. Sibsagar (Assam).

Var. *minor* n. Length: only 7 millims. Abdomen bright rufo-ferruginous; legs brown; thorax and antennæ dark brown. In other respects like the typical form. Sibsagar.

7. *P. SPINIGERA*, Mayr (Verh. k. k. zool.-bot. Ges. Wien, 4 Dec. 1878). Sibsagar.

8. *P. DIVES*, Smith (Cat. Brit. Mus. p. 60) (= *acantha*, Sm., Proc. L. S. Z. V. 1860, p. 98, sec. Mayr), ♀. Sibsagar. The sole ♀ is a variety with the abdomen brown, the pubescence coarser and a little more fasciculate, the abdomen having coarser and more abundant raised wrinkles than the typical form. The pronotum a little broader anteriorly.

9. *P. ACASTA*, Smith (Proc. L. L. S. 1860, V. 100)? (perhaps = *argentea*, Mayr, Verh. zool.-bot. Ges. Wien 1862), ♀. The silvery pubescence is not dense. The spines of the metanotum are straight, divergent, twice as distant at the base as in *P. dives*, as long as the distance between their bases. Basal surface of the metanotum much broader than long (in *P. dives* longer than broad). Abdomen of the Sibsagar specimen brownish, legs reddish yellow with the coxæ, tarsi, and the base of the tibiæ blackish-brown. Length 5.5 millims. Sibsagar.

10. *P. FURCATA*, Smith (Cat. Brit. Mus. p. 64), ♀. Variety with the abdomen black (rufo-testaceous in Smith's type). A very distinct, curious species, with the head and abdomen wholly smooth and shining, the thorax and petiole very coarsely, unevenly, and deeply reticulate (reticulate-punctate), the scale cylindric, much raised, bearing two long spines curved like chamois horns.

Smith's description is to be completed as follows:—

Thorax deeply emarginate between the mesonotum and the metanotum. Pronotum and mesonotum together strongly arched longitudinally and transversely. Basal surface of the metanotum very short. Clypeus carinate. Mandibles smooth and shining with scattered puncture. The whole body more or less covered with long, yellowish-white erect hairs and with a very scattered coarse pubescence. Tibiæ and scapi with long and perpendicularly erect hairs. Length 5.5—6 millims. Sibsagar (Makes a nest in trees and is said to stridulate, but I

have found no stridulating organs and suspect the insect merely scrapes dry leaves with end of abdomen.—Wood-Mason).

An aberrant specimen having the scale lower and more squamiform, the scale-horns removed from one another and lowered towards the abdomen, the body more pilose, the thorax and the abdomen dark reddish-brown,—also comes from Sibsagar.

The *Polyrhachis furcata* belongs to the group "*armata*" of Mayr.

11. *G. STRIATA*, Mayr (Verh. k. k. zool.-bot. Ges. Wien 1862), ♂ and ♀. The hairs on the body are yellowish brown and not black as Mayr has stated. The ♀ is only 11 millims. in length, differing from the ♂ in having the abdomen very opaque, very closely punctured between the wrinkles; then the spines of the pronotum and the superior spines of the scale are shorter. The wings are wanting. Tavoy and Sibsagar.

12. *P. MAYREI*, Roger (Verzeichniss etc., Berl. ent. Zeitschr (1863).

Subsp. *P. intermedia*, n. st., ♂. Differs from the *P. Mayrei*, i. sp., in having only scattered erect hairs (the tibiæ and scapi have only a few very scattered erect hairs), the laminæ frontales more approximated, the abdomen brownish, with much less abundant gray (not golden) pubescence. The sculpture of the abdomen can easily be seen through the pubescence. Sibsagar.

This subspecies is allied to *P. proxima*, Roger (Berl. ent. Zeitschr. 1863), by its erect hairs and by its approximated laminæ frontales. But it differs from that species in the broadness and the stout form of its thorax (stouter than in *P. mayrei*, i. sp.), by its stout metanotal teeth, by the very distant superior spines of its broad scale, between which is a little tooth.

The *P. intermedia* induces me, however, to believe that the *P. proxima*, Roger, is also only a subspecies of *P. mayrei*. A specimen of *P. intermedia* has the abdomen black.

13. *P. RELUCENS*, Latr. (Hist. nat. Fourm.) ? *DECIPIENS*, Roger (Berl. ent. Zeitschr 1863) ? ♀. This ♀ cannot be more accurately determined without the ♂. Pegu.

14. *P. LÆVISIMA*, Smith, var. *DICHOUS* n., ♂. Differs from the typical form only in having the abdomen and the legs yellowish fulvaceous, with the antennæ and the anterior part of the head reddish brown. The rest of the body is black. Sibsagar.

N. B. The species *Polyrhachis affinis*, Le Guillou, according to Mayr (Formicidæ Borneenses, Ann. Mus. civ. Genova, 1872), is synonymous with *P. bihamata*, Drury. The name *Polyrhachis affinis* must therefore be restored to the *Polyrhachis vicina*, Roger (*vicina*, Roger, Verzeichniss, 1863, = *affinis*, Smith, Cat. Brit. Mus. 1858). Thus the last species

must be called "*Polyrhachis affinis*, Smith (*nec* Le Guillou) = *P. vicina*, Roger."

Smith (Proceed. Lin. Soc., March 1863) has described two different species of *Polyrhachis*, *P. dolomedes* (No. 1, p. 14) ♀ and ♀ from Ceram and *P. dolomedes* (No. 2, p. 16) ♀ from Waigiou, under the same name! Analogous mistakes have been committed several times by Smith: for instance, in Journal Proceed. Lin. Soc. Suppl. Vol. V, pp. 104, 105, two quite different *Ponera simillima*, Smith, are to be seen: the one p. 104 = *Lobopelta diminuta*, Smith, and the other p. 105 = *Ponera affinis*, Roger (sec. Mayr, Verh. k. k. zool.-bot. Ges. Wien, 1862, and Roger Berl. ent. Zeitschr 1860). But the double *Polyrhachis dolomedes* is not yet corrected, and I propose to name the *P. dolomedes* No. 2, *Polyrhachis pseudonyma*, n. sp., if this species is not synonymous with *P. wiphius*, Smith (l. c.)!

Genus CECOPHYLLA.

15. *C. SMARAGDINA*, Fab., ♀ and ♀. Also found in Sibsagar, Pegu, Arrakan, and South Andaman Island.

Genus MYRMECOCYSTUS.

Wesmaël, Bullet. Acad. Roy. Bruxelles 1838, = *Cataglyphis*, Foerst., Verh. Nath. V. Rheinl 1850, = *Monocombus*, Mayr, Formicina Anstriaca, Verh. z.-b. Ver. Wien, 1855.

16. *M. VIATICUS*, Fab. (Mant. Insect. sist. 1787), ♀. Kurhurbali. This Mediterranean species has hitherto been found to extend only as far as Persia and Turkestan, and is here recorded from India for the first time. The Indian specimens are typical, only a little more pubescent on the metanotum.

II. Subfamily Dolichoderidæ.

Genus DOLICHODERUS.

Lnnd, Annales des Sciences nat. xxiii, 1831 (Forel, Bullet. Soc. vaud. Sc. nat. vol. xv, 1878).

17. *D. MOGGRIDGEI*, n. sp., ♀. Length 2.3 millims. Head short oval, broad, with very convex sides, very straitened behind, and there also semicircularly emarginate, about the neck of the pronotum. The posterior edge of the head, about the slope, is sharp, slightly raised, and nearly angle-shaped at both ends. Clypeus anteriorly with a deep, transverse, and curved impressed line, which runs from one anterior angle of the head to the other. The clypeus is very convex behind this impressed line. Frontal area and frontal sulcus indistinct.

Viewed from the side, the thorax ascends straight from the neck towards the middle of the mesonotum, this middle being the summit of an

obtuse angle. From the middle of the mesonotum it descends again as far as the deep meso-metanotal strangulation. The middle of this descending surface is interrupted by the two protuberant stigmas. The basal surface of the metanotum is very abruptly ascending, hardly arched, and terminated behind by a transverse nearly rectilinear edge, which forms with the declivous surface a right or nearly acute angle. The declivous surface of the metanotum is plane above and concave below.

Viewed above, the pronotum is flattened, widened, trapeziform; the mesonotum is elongate and has a strong longitudinal impressed line with two edging blunt elevations in the middle of its sides; the basal surface of the metanotum is rectangular, longer than broad.

Scale raised, hardly inclined, moderately thick, evenly convex in front and behind, with the upper edge transverse and slightly rounded. The abdomen of the sole specimen is deformed.

Mandibles smooth and shining with very scattered puncture. The whole body shining, especially the head. The head very delicately reticulate at the sides. On the anterior surface of the head, this sculpture passes into a very delicate scattered puncture, which replaces the reticulations. Thorax more or less delicately reticulate, except the declivous surface of the metanotum, which is smooth. Scale delicately reticulate or punctate. Abdomen with very delicate scattered puncture. No erect hairs. An extremely fine and much applied pubescence is scattered over the whole body, especially on the abdomen, on the scapi, and on the legs, where it forms a slight and delicate down.

Uniformly dark brownish or reddish yellow. Antennæ and legs clearer.

Gizzard (proventriculus) without sepals, of the same shape as in the other species of the genus *Dolichoderus*, for instance, very like that of *D. bispinosus*. I softened the abdomen in water, and was thus enabled to dissect out that organ without destroying the specimen. Sibsagar.

N. B. I have found the gizzard of *D. mariaë*, Forel, very like that of *D. 4-punctatus* of Europe.

III. Subfamily **Poneridæ**.

Genus **PONERA**.

18. **PONERA LEEUWENHEKI**, n. sp., ♀. Resembles a little the *P. insulana*, Mayr, and *P. tesserinoda*, Mayr, but is quite distinct. Length: 7.5—8 millims. Mandibles shorter and broader than in *P. tesserinoda*, strongly striate, with scattered puncture above the striation, armed with 7 teeth.

A very distinct groove runs obliquely from the inner articular angle to the exterior edge of the mandibles (as in *P. tesserinoda* and *sulcata*). A much raised longitudinal carina in the middle of the clypeus (as in *P. insulana*), which is slightly acuminate or toothed in the middle of its anterior edge. Eyes smaller by half than in *P. tesserinoda*, situated on the anterior quarter of the sides of the head. Head broad, a little narrowed behind, and there broadly concave. The anterior edge of this concavity forms a right angle with the anterior surface of the head. The perpendicularly truncate posterior surface of the occiput is obliquely striate or wrinkled and shining. The sides of the head are more or less flattened and submarginate. Head longitudinally striate beneath, coarsely reticulate and finely granulate above (anteriorly). On the forehead and the cheeks the reticulations pass into longitudinal wrinkles.

Thorax moderately short; a lamelliform tooth at the anterior inferior angle of the pronotum. The meso-metanotal suture wholly obliterated. Declivous surface of the metanotum truncate, plane, oval, and margined by a small subdenticulate edge. This truncation is shining, transversely wrinkled below, the wrinkles being more effaced above. Pronotum semicircularly reticulate-rugose, mesonotum longitudinally so, both in addition with scattered and moderately effaced extremely coarse puncture. The basal surface of the metanotum with an extremely coarse and deep reticulate-punctate-rugose sculpture.

Scale like that of *P. tesserinoda*, but nearly twice as broad as thick. Its anterior and posterior surfaces are both truncate and transversely wrinkled. Its periphery has an extremely coarse and deep puncture, between which it is rugose. A rounded hump under the petiole.

Abdomen truncated anteriorly; the truncation shining and nearly smooth. The rest of the first segment reticulate-rugose (transversely so in front, longitudinally behind); besides, it is very coarsely scattered and effaced-punctured. The other segments of the abdomen are shining and delicately, more or less effaced reticulate-rugose (transversely so on the base, longitudinally so on the end of each), with scattered not coarse puncture. Legs and antennæ strongly punctured.

The spurs of all the legs pectinate. Some rare scattered erect hairs, especially on the tibiæ and scapi. A short, much spaced applied pubescence is scattered everywhere. This pubescence is extremely fine on the abdomen.

Brownish black. Abdomen dark reddish brown. Legs, antennæ, mandibles, *laminæ frontales*, and anterior edge of the head reddish. Sibsagar.

Genus BOTHROPONERA.

Mayr, Verh. k. k. zool.-bot. Ges. Wien. xii. 1862.

19. *B. RUFIPES*, Jerdon (Madr. Journ. Lit. & Sc. 1851, 119: *Ponera*), ♀. Sibsagar.

In the same box with *B. rufipes* (Sibsagar Assam $\frac{2\frac{1}{2}}{1\frac{1}{2}}$) is another *Bothroponera*, which differs from *B. rufipes* only in having two stout, blunt, triangular, and flattened spines at the metanotum. These spines, or lamelliform large teeth, have a posterior concavity, which is directly continued into the declivous surface of the metanotum and sharp edged in common therewith, whilst the anterior convex side is directly continuous with the basal and lateral surface.

This toothed *Bothroponera* agrees in every respect with the description of "*Pachycondyla (Bothroponera) bispinosa*, Smith" (Cat. Brit. Mus. p. 107); only the longer tooth at the lateral angles of the scale is wanting.

Now Mayr (Journ. Mus. Godeffroy Hamburg, XII, 1876, p. 32) has found that *Bothroponera piliventris*, Sm., an Australian species closely allied to *B. rufipes*, offers a very peculiar sort of dimorphism in the ♀, the first category of ♀ having a narrow and entire scale, the second a broad and emarginate one.

The toothed *Bothroponera (bispinosa)* from Sibsagar agrees so completely in every minute detail, except the teeth or spines, with *C. rufipes*, that I venture to suggest that the two belong to the same species and constitute a new case of dimorphism in the ♀ of ants, *P. bispinosa* being the dimorphic form of *P. rufipes*.

It is easy to confirm or to refute my supposition by the observation of the living colony, especially of the pupæ in the nests.

Genus ODONTOPONERA.

Mayr, Verh. k. k. zool.-bot. Ges. Wien, 1862.

20. *O. DENTICULATA*, Smith (Cat. Brit. Mus. p. 90), ♀. Sikkim.

Genus LOBOPELTA.

21. *L. MUTABILIS*, Smith (Proc. Lin. Soc. Zool. 1861, p. 15), ♀. Sibsagar.

22. *L. WOOD-MASONI*, n. sp., ♀. Resembles the *L. castanea*, Mayr, but very distinct by its large and wide strangulation between the mesothorax and the metathorax.

Length 6.2 mill. Long and narrow; the legs and especially the antennæ very long. Head oval. Eyes large, flat, situated at the anterior $\frac{2}{3}$ of the head. The second joint of the funiculus longer than the

first. Mandibles rather broad, striated; their terminal edge long sharp, with a pointed tooth at the end and an obtuse one at its posterior third. Clypeus very triangularly advanced, nearly acuminate, strongly carinate, longitudinally striated. *Laminae frontales* extremely short; *sulcus frontalis* broad and short. The sides and the anterior part of the head longitudinally striated. Vertex and occiput shining, nearly smooth. Mesothorax strongly strangulated after the mesonotum; the strangulation much widened. Mesonotum small and narrow. The basal surface of the metanotum narrow, rounded, as long as the pronotum and the mesonotum together. The declivous one moderately short, transversely wrinkled, rounded at the sides and above. The rest of the thorax is shining and nearly smooth, except the sides of the mesothorax and of the metathorax, which are more or less rugose. Scale raised, narrowed in front, smooth and shining, as long as the breadth of its posterior surface. Abdomen shining and nearly smooth, strongly strangulated after the first segment.

Here and there a few erect hairs on the legs, the scapi, and the under side of the body. Applied pubescence nearly totally wanting. Yellowish or reddish brown, darker over the head, the thorax, and the scale. Funiculi, tibiae, and tarsi testaceous. Sibsagar.

N. B.—Smith (Trans. Ent. Soc. Lond. 1876, Part IV, 6 Sept.) describes a *Ponera castanea* from New Zealand and says that the genus *Ponera* had not been previously ascertained to inhabit New Zealand. Now Mayr had previously (Novara Reise, Formicidæ, p. 69, 1865) also described a *Ponera castanea* (!) from Auckland (New Zealand); but I cannot ascertain if *P. castanea*, Smith, and *P. castanea*, Mayr, are two different species or not.

V. Subfamily Myrmicidæ.

Genus SIMA.

23. *S. RUFONIGRA*, Jerdon, ♀. Also from Sibsagar.

Genus CAREBARA.

Westwood, Ann. & Mag. Nat. Hist. 1841, vi. 86.

24. *C. LIGNATA*, Westw. (l. c. ♀); Smith (Cat. Brit. Mus. ♂), ♀, Sibsagar, ♂ Pegu.

Genus APHÆNOGASTER.

Mayr, Verh. z.-b. Ges. Wien, 1853, = *Atta autorum*, nec Fabricii.

25. *A. BARBARA*, L. (Systema Naturæ I. 962 ♀).

Var. *semirufa*, André (Species d. Formic. d' Europe, 1881-82), ♀ West shore of Sea of Galilee.

Var. *punctata* n., ♀ media-major. Length 6·3 millims. Head smooth and shining with very scattered, but distinct and moderately coarse puncture, besides with some divergent effaced striæ. Pronotum and mesonotum rugose. Two elongate tubercles on the metanotum. Dark reddish brown. Abdomen dark chestnut-brown. In other respects like the other varieties. Kashmir.

The *A. barbara* is a very variable Mediterranean species and has hitherto been found as far as Asia Minor and Turkestan, but not in India.

Genus PHEIDOLE.

27. *P. INDICA*, Mayr, ♀. Also from Port Canning, near Calcutta.

Genus CREMASTOGASTER.

Lund, Ann. d. Sc. nat. 1881, 132, = *Acrocelia*, Mayr, Verh. z.-b. Ges. Wien, 1852.

28. *C. SUBNUDA*, Mayr (Verh. k. k. z.-b. Ges. Wien, 4 Dec. 1878), ♀ *variety*. Differs from Mayr's description only in having the mandibles entirely striated, the funiculi not clearer than the rest of the antenna, the second node of the petiole entirely smooth, the spines of the metanotum slightly concave exteriorly, and in being longer (4 millim.). Sibsagar.

29. *C. FLAVA*, n. sp., ♀. Length 4·2—5 millims. Entirely of a pale yellow; only the posterior half of the abdomen with a brownish tinge. Slender; legs and antennæ rather long. Resembles a little the *C. rogenhoferi*, Mayr. The club of the antennæ 3-jointed. Mandibles closely striated. Head and thorax opaque. Head entirely longitudinally striated; its sides and posterior angles have besides a regularly spaced and rather coarse puncture. The striæ diverge towards the occiput, which has also sinuous, more or less transverse striæ.

Thorax rather narrow. Pronotum moderately flattened above, with the sides a little prominent. Mesonotum with two lateral carinæ, between which it is concave, a little enlarged in front, rounded at its anterior margin. Spines of the metanotum little divergent, moderately convex exteriorly, a little shorter than the interval between their bases. The declivous surface of the metanotum smooth, shining, much longer than the basal one. The rest of the thorax longitudinally rugose and delicately reticulate-punctate between the wrinkles.

The first node of the petiole viewed from above, as in *C. rogenhoferi*, flattened, broad, with a semicircular anterior edge, which is terminated by two angles at the middle of the sides. From these angles, each posterior half of the sides is concave and converges strongly towards the posterior edge, where it is terminated by a little protuberance. The posterior edge is emarginate between these protuberances. The second

node is longitudinally and broadly, but not very deeply sulcated in the middle (the sulcus is deep in *C. dohrni*, Mayr, and *rogenhoferi*, Mayr). Petiole and abdomen shining and delicately reticulate; some longitudinal wrinkles on the second node.

Some erect hairs on the thorax and on the head, very few elsewhere, none at all on the tibiæ and scapi. A spaced, but regular, applied pubescence on the tibiæ, the scapi, the head, and the abdomen, very scattered elsewhere? Sibsagar.

